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TECH CENTER 1600/2900

SEQUENCE LISTING

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Alvarez, Inaki
Perez, Pascual

<120> Amino acid-enriched plant protein
reserves, particularly lysine-enriched maize gamma-zein, and
plants expressing such proteins

<130> 50062/004001

<140> 09/117,246
<141> 1998-12-03

<150> PCT/FR97/00167
<151> 1997-01-28

<150> FR96/01004
<151> 1996-01-29

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<213> Artificial Sequence

<220>
<223> based on Maize

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44

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<212> DNA
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<220>
<223> based on Maize

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<212> PRT
<213> Maize

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1 5 10 15

Pro

<210> 4
<211> 28
<212> PRT
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<400> 4
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1 5 10 15
Lys Pro Lys Pro Lys Pro Lys Glu Phe Leu Gln Pro
20 25

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<211> 20
<212> PRT
<213> Maize

<400> 5
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1 5 10 15
Phe Lys Leu Asp
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<211> 672
<212> DNA
<213> Maize

<220>
<221> CDS
<222> (1)...(672)

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1 5 10 15

gcc acc tcc acg cat aca agc ggc ggc tgc ggc tgc cag cca ccg ccg 96
Ala Thr Ser Thr His Thr Ser Gly Gly Cys Gly Cys Gln Pro Pro Pro
20 25 30

ccg gtt cat cta ccg ccg gtc cat ctg cca cct ccg gtt cac ctg 144
Pro Val His Leu Pro Pro Val His Leu Pro Pro Pro Val His Leu
35 40 45

cca cct ccg gtg cat ctc cca ccg ccg gtc cac ctg ccg ccg gtc 192
Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val
50 55 60

cac ctg cca ccg ccg gtc cat gtg ccg ccg ccg gtt cat ctg ccg ccg 240
His Leu Pro Pro Pro Val His Val Pro Pro Pro Val His Leu Pro Pro
65 70 75 80

cca cca tgc cac tac cct act caa ccg ecc cgg cct cag cct cat ccc Pro Pro Cys His Tyr Pro Thr Gln Pro Pro Arg Pro Gln Pro His Pro 85 90 95	288
cag cca cac cca tgc ccg tgc caa cag ccg cat cca agc ccg tgc cag Gln Pro His Pro Cys Pro Cys Gln Gln Pro His Pro Ser Pro Cys Gln 100 105 110	336
ctg cag gga acc tgc ggc gtt ggc agc acc ccg atc ctg ggc cag tgc Leu Gln Gly Thr Cys Gly Val Gly Ser Thr Pro Ile Leu Gly Gln Cys 115 120 125	384
gtc gag ttt ctg agg cat cag tgc agc ccg acg gcg acg ccc tac tgc Val Glu Phe Leu Arg His Gln Cys Ser Pro Thr Ala Thr Pro Tyr Cys 130 135 140	432
tcg cct cag tgc cag tcg ttg cgg cag cag tgt tgc cag cag ctc agg Ser Pro Gln Cys Gln Ser Leu Arg Gln Gln Cys Cys Gln Gln Leu Arg 145 150 155 160	480
cag gtg gag ccg cag cac ccg tac cag gcg atc ttc ggc ttg gtc ctc Gln Val Glu Pro Gln His Arg Tyr Gln Ala Ile Phe Gly Leu Val Leu 165 170 175	528
cag tcc atc ctg cag cag ccg caa agc ggc cag gtc gcg ggg ctg Gln Ser Ile Leu Gln Gln Pro Gln Ser Gly Gln Val Ala Gly Leu 180 185 190	576
ttg gcg gcg cag ata gcg cag caa ctg acg gcg atg tgc ggc ctg cag Leu Ala Ala Gln Ile Ala Gln Gln Leu Thr Ala Met Cys Gly Leu Gln 195 200 205	624
cag ccg act cca tgc ccc tac gct gct gcc ggc ggt gtc ccc cac tga Gln Pro Thr Pro Cys Pro Tyr Ala Ala Ala Gly Gly Val Pro His * 210 215 220	672

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 20 25 30
 Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu
 35 40 45
 Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val
 50 55 60
 His Leu Pro Pro Pro Val His Val Pro Pro Pro Val His Leu Pro Pro
 65 70 75 80
 Pro Pro Cys His Tyr Pro Thr Gln Pro Pro Arg Pro Gln Pro His Pro
 85 90 95
 Gln Pro His Pro Cys Pro Cys Gln Gln Pro His Pro Ser Pro Cys Gln
 100 105 110

Leu Gln Gly Thr Cys Gly Val Gly Ser Thr Pro Ile Leu Gly Gln Cys
 115 120 125
 Val Glu Phe Leu Arg His Gln Cys Ser Pro Thr Ala Thr Pro Tyr Cys
 130 135 140
 Ser Pro Gln Cys Gln Ser Leu Arg Gln Gln Cys Cys Gln Gln Leu Arg
 145 150 155 160
 Gln Val Glu Pro Gln His Arg Tyr Gln Ala Ile Phe Gly Leu Val Leu
 165 170 175
 Gln Ser Ile Leu Gln Gln Pro Gln Ser Gly Gln Val Ala Gly Leu
 180 185 190
 Leu Ala Ala Gln Ile Ala Gln Gln Leu Thr Ala Met Cys Gly Leu Gln
 195 200 205
 Gln Pro Thr Pro Cys Pro Tyr Ala Ala Ala Gly Gly Val Pro His
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 <212> DNA
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 Ala Thr Ser Thr His Thr Ser Gly Gly Cys Gly Cys Gln Pro Pro Pro
 20 25 30
 ccg gtt cat cta ccg ccg gtg cat ctg cca cct ccg gtt cac ctg 144
 Pro Val His Leu Pro Pro Val His Leu Pro Pro Pro Val His Leu
 35 40 45
 cca cct ccg gtg cat ctc cca ccg ccg gtc cac ctg ccg ccg gtc 192
 Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val
 50 55 60
 cac ctg cca ccg ccg gtc cat gtg ccg ccg gtt cat ctg ccg ccg 240
 His Leu Pro Pro Pro Val His Val Pro Pro Pro Val His Leu Pro Pro
 65 70 75 80
 cca cca tgc cac tac cct actcaa ccg ccc ccg atc gaa ttc aaa cca 288
 Pro Pro Cys His Tyr Pro Thr Gln Pro Pro Arg Ile Glu Phe Lys Pro
 85 90 95
 aag cca aag ccg aag cca aaa gaa ttc aaa cca aag cca aag ccg aag 336
 Lys Pro Lys Pro Lys Glu Phe Lys Pro Lys Pro Lys Pro Lys
 100 105 110
 cca aaa gaa ttc ctg cag ccc ctg cag gga acc tgc ggc gtt ggc agc 384
 Pro Lys Glu Phe Leu Gln Pro Leu Gln Gly Thr Cys Gly Val Gly Ser
 115 120 125

acc ccg atc ctg ggc cag tgc gtc gag ttt ctg agg cat cag tgc agc	432
Thr Pro Ile Leu Gly Gln Cys Val Glu Phe Leu Arg His Gln Cys Ser	
130 135 140	
ccg acg gcg acg ccc tac tgc tcg cct cag tgc cag tcg ttg cgg cag	480
Pro Thr Ala Thr Pro Tyr Cys Ser Pro Gln Cys Gln Ser Leu Arg Gln	
145 150 155 160	
cag tgt tgc cag cag ctc agg cag gtg gag ccg cag cac ccg tac cag	528
Gln Cys Cys Gln Gln Leu Arg Gln Val Glu Pro Gln His Arg Tyr Gln	
165 170 175	
gcg atc ttc ggc ttg gtc ctc cag tcc atc ctg cag cag cag ccg caa	576
Ala Ile Phe Gly Leu Val Leu Gln Ser Ile Leu Gln Gln Pro Gln	
180 185 190	
agc ggc cag gtc gcg ggg ctg ttg gcg gcg cag ata gcg cag caa ctg	624
Ser Gly Gln Val Ala Gly Leu Leu Ala Ala Gln Ile Ala Gln Gln Leu	
195 200 205	
acg gcg atg tgc ggc ctg cag cag ccg act cca tgc ccc tac gct gct	672
Thr Ala Met Cys Gly Leu Gln Gln Pro Thr Pro Cys Pro Tyr Ala Ala	
210 215 220	
gcc ggc ggt gtc ccc cac tga	693
Ala Gly Gly Val Pro His *	
225 230	

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 <211> 230
 <212> PRT
 <213> maize

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 20 25 30
 Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu
 35 40 45
 Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val
 50 55 60
 His Leu Pro Pro Pro Val His Val Pro Pro Pro Val His Leu Pro Pro
 65 70 75 80
 Pro Pro Cys His Tyr Pro Thr Gln Pro Pro Arg Ile Glu Phe Lys Pro
 85 90 95
 Lys Pro Lys Pro Lys Pro Lys Glu Phe Lys Pro Lys Pro Lys Pro Lys
 100 105 110
 Pro Lys Glu Phe Leu Gln Pro Leu Gln Gly Thr Cys Gly Val Gly Ser
 115 120 125
 Thr Pro Ile Leu Gly Gln Cys Val Glu Phe Leu Arg His Gln Cys Ser
 130 135 140
 Pro Thr Ala Thr Pro Tyr Cys Ser Pro Gln Cys Gln Ser Leu Arg Gln
 145 150 155 160
 Gln Cys Cys Gln Gln Leu Arg Gln Val Glu Pro Gln His Arg Tyr Gln
 165 170 175
 Ala Ile Phe Gly Leu Val Leu Gln Ser Ile Leu Gln Gln Pro Gln

180	185	190
Ser Gly Gln Val Ala Gly Leu Leu Ala Ala Gln Ile Ala Gln Gln Leu		
195	200	205
Thr Ala Met Cys Gly Leu Gln Gln Pro Thr Pro Cys Pro Tyr Ala Ala		
210	215	220
Ala Gly Gly Val Pro His		
225	230	

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 <212> DNA
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 <220>
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gcc acc tcc acg cat aca agc ggc ggc tgc ggc tgc cag cca ccg ccg				96
Ala Thr Ser Thr His Thr Ser Gly Gly Cys Gly Cys Gln Pro Pro Pro				
20	25	30		
ccg gtt cat cta ccg ccg gtg cat ctg cca cct ccg gtt cac ctg				144
Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu				
35	40	45		
cca cct ccg gtg cat ctc cca ccg ccg gtc cac ctg ccg ccg ccg gtc				192
Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val				
50	55	60		
cac ctg cca ccg ccg gtc cat gtg ccg ccg gtt cat ctg ccg ccg				240
His Leu Pro Pro Pro Val His Val Pro Pro Pro Val His Leu Pro Pro				
65	70	75	80	
cca cca tgc cac tac cct act caa ccg ccc ccg cct cag cct cat ccc				288
Pro Pro Cys His Tyr Pro Thr Gln Pro Pro Arg Pro Gln Pro His Pro				
85	90	95		
cag cca cac cca tgc ccg tgc caa cag ccg cat cca agc ccg tgc cag				336
Gln Pro His Pro Cys Pro Cys Gln Gln Pro His Pro Ser Pro Cys Gln				
100	105	110		
atc gaa ttc aaa cca aag cca aag ccg aag cca aaa gaa ttc ctg cag				384
Ile Glu Phe Lys Pro Lys Pro Lys Pro Lys Pro Lys Glu Phe Leu Gln				
115	120	125		
ccc ctg cag gga acc tgc ggc gtt ggc agc acc ccg atc ctg ggc cag				432
Pro Leu Gln Gly Thr Cys Gly Val Gly Ser Thr Pro Ile Leu Gly Gln				
130	135	140		
tgc gtc gag ttt ctg agg cat cag tgc agc ccg acg gcg acg ccc tac				480
Cys Val Glu Phe Leu Arg His Gln Cys Ser Pro Thr Ala Thr Pro Tyr				
145	150	155	160	

tgc tcg cct cag tgc cag tcg ttg cgg cag cag tgt tgc cag cag ctc	528
Cys Ser Pro Gln Cys Gln Ser Leu Arg Gln Gln Cys Cys Gln Gln Leu	
165 170 175	
agg cag gtg gag ccg cag cac cgg tac cag gcg atc ttc ggc ttg gtc	576
Arg Gln Val Glu Pro Gln His Arg Tyr Gln Ala Ile Phe Gly Leu Val	
180 185 190	
ctc cag tcc atc ctg cag cag ccg caa agc ggc cag gtc gcg ggg	624
Leu Gln Ser Ile Leu Gln Gln Pro Gln Ser Gly Gln Val Ala Gly	
195 200 205	
ctg ttg gcg gcg cag ata gcg cag caa ctg acg gcg atg tgc ggc ctg	672
Leu Leu Ala Ala Gln Ile Ala Gln Gln Leu Thr Ala Met Cys Gly Leu	
210 215 220	
cag cag ccg act cca tgc ccc tac gct gct gcc ggc ggt gtc ccc cac	720
Gln Gln Pro Thr Pro Cys Pro Tyr Ala Ala Gly Gly Val Pro His	
225 230 235 240	
tga	723
*	

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<400> 11	
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20 25 30	
Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu	
35 40 45	
Pro Pro Pro Val His Leu Pro Pro Pro Val His Leu Pro Pro Pro Val	
50 55 60	
His Leu Pro Pro Pro Val His Val Pro Pro Pro Val His Leu Pro Pro	
65 70 75 80	
Pro Pro Cys His Tyr Pro Thr Gln Pro Pro Arg Pro Gln Pro His Pro	
85 90 95	
Gln Pro His Pro Cys Pro Cys Gln Gln Pro His Pro Ser Pro Cys Gln	
100 105 110	
Ile Glu Phe Lys Pro Lys Pro Lys Pro Lys Pro Lys Glu Phe Leu Gln	
115 120 125	
Pro Leu Gln Gly Thr Cys Gly Val Gly Ser Thr Pro Ile Leu Gly Gln	
130 135 140	
Cys Val Glu Phe Leu Arg His Gln Cys Ser Pro Thr Ala Thr Pro Tyr	
145 150 155 160	
Cys Ser Pro Gln Cys Gln Ser Leu Arg Gln Gln Cys Cys Gln Gln Leu	
165 170 175	
Arg Gln Val Glu Pro Gln His Arg Tyr Gln Ala Ile Phe Gly Leu Val	
180 185 190	
Leu Gln Ser Ile Leu Gln Gln Pro Gln Ser Gly Gln Val Ala Gly	
195 200 205	

Leu Leu Ala Ala Gln Ile Ala Gln Gln Leu Thr Ala Met Cys Gly Leu
210 215 220
Gln Gln Pro Thr Pro Cys Pro Tyr' Ala Ala Gly Gly Val Pro His
225 230 235 240